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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,417	07/27/2001	William J. Allen	60980079-2	7018

7590 09/13/2005

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EXAMINER	
LEE, TOMMY D	

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 09/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/915,417	ALLEN ET AL.	
	Examiner	Art Unit	
	Thomas D. Lee	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response

1. This Office action is responsive to applicant's response filed June 22, 2005. Claims 1 and 3-27, as recited in a preliminary amendment filed July 27, 2001, are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 17, 23, 25 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 is a "computer readable storage medium" claim depending from "method" claim 4. Claim 17 is assumed to depend from claim 14.

Claims 23 and 26 are "system" claims depending from "computer readable storage medium" claim 21. Claims 23 and 26 are assumed to depend from claim 22.

In claim 25, "said calibration patch" lacks proper antecedent basis. While "a calibration patch" is recited in claim 24, it should be noted that claim 25 depends from claim 23, which does not recite such a patch.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1 and 3-27 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,831,756 (Ushiroda).

Regarding claim 1, Ushiroda discloses a method of generating halftone threshold matrix data for an image printer, said method comprising the steps of: taking a stored high bit content halftone matrix data (mother threshold mask consists of 256x256 items, each of which stores a value ranging from 1 to 65536 (16 bits) (column 3, lines 21-25; column 4, lines 9-22; Fig. 2)); reducing said high bit content halftone matrix data to a relatively lower bit content halftone matrix data, within said image printer, wherein said step of reduction comprises incorporating a printer response correction function into said relatively low bit content halftone matrix data (daughter threshold mask, wherein each cell stores a threshold value ranging from 1 to 255 (8 bits), generated from mother threshold mask (column 4, lines 28-35; Fig. 4); correction look-up table for generating daughter mask from mother mask (Fig. 3) created in accordance with output characteristics of the printer corresponding to a specific paper type (column 5, line 52 – column 6, line 21) or various conditions such as the use of environment, total print count, and the like (column 10, line 28 – column 11, line 17)).

Regarding claims 3 and 4, Ushiroda discloses a method of generating a halftone matrix data having a predetermined response of a number of dots printed as a function of digital input value, said method characterized by comprising the steps of: storing data describing a plurality of data elements as a plurality of vector entries, each said vector entry comprising an index number corresponding to a higher bit content per element halftone threshold level, an X coordinate data corresponding to a position in a first

dimension, and a Y coordinate data corresponding to a position of said entry in a second dimension, said X and Y coordinate data positioning said index number in a two dimensional plane (mother threshold mask (Fig. 2) shows X coordinate data along the top of the mask, Y coordinate data along the left side of the mask, and index numbers corresponding to higher bit content per element halftone threshold level stored in cells of mask (column 4, lines 9-22)); storing a tone correction data as a list of numbers (correction look-up table (Fig. 3; column 4, lines 23-27)); sequencing through said list of numbers and for each said number of said list, assigning a halftone threshold level to a corresponding number of said vector entries, wherein for each said number of said list, a different said halftone threshold value is assigned (Fig. 6 flow chart shows sequencing steps (column 5, lines 16-51)); and generating a lower bit content per element two dimensional halftone threshold level matrix from said plurality of vector entries and their corresponding respective assigned halftone threshold levels (Fig. 6 further shows generation of lower bit content values corresponding to threshold values in daughter mask (column 5, lines 16-51)). Said step of generating a two dimensional halftone level matrix comprises: for each said vector data entry, storing a threshold level data assigned to said index value in a position within said two dimensional halftone threshold level matrix corresponding to said X and Y coordinates of said vector data entry (column 5, lines 29-51).

It should be noted that the values stored in the mother mask, along with X and Y coordinate data, are vector entries, as broadly defined in applicant's claims ("vector entry comprising an index number corresponding to a higher bit content per element

halftone threshold level, an X coordinate data corresponding to a an X coordinate data corresponding to a position in a first dimension, and a Y coordinate data corresponding to a position of said entry in a second dimension, said X and Y coordinate data positioning said index number in a two dimensional plane" (claim 3, lines 6-10)).

Regarding claims 5-8, Ushiroda discloses a method of generating halftone threshold data for an image printing system, said method characterized by comprising the steps of: storing a higher bit content threshold level data, comprising a plurality of individual threshold level elements (mother threshold mask (Fig. 2)); converting said higher bit content threshold level data into at least one level vector, said level vector comprising a plurality of vector data entries each of an index value number representing a high bit content level value of a halftone threshold level value, and a corresponding coordinate of said threshold level value (mother threshold mask shows X coordinate data along the top of the mask, Y coordinate data along the left side of the mask, and index numbers corresponding to higher bit content per element halftone threshold level stored in cells of mask (column 4, lines 9-22)); applying a tone correction function by specifying a number of said vector data entries to be selected (correction look-up table (Fig. 3; column 4, lines 23-27)); selecting said number of vector data entries from said plurality of vector data entries in said level vector, said selected plurality of vector data entries having highest index numbers, corresponding to highest threshold level numbers of said plurality of vector data entries (column 5, lines 16-51; Fig. 6); and transforming said plurality of selected vector data entries into a lower bit content two dimensional threshold data (column 5, lines 16-51; Fig. 6). Said high bit content threshold level data

comprises a matrix having 16 bits per element (65,536 values in mother threshold mask correspond to 16 bits). Said low bit content threshold data comprises a plurality of elements each having 8 bits per element (256 values in daughter threshold mask correspond to 16 bits). Said high bit content threshold level data comprises a plurality of two-dimensional planes, wherein one said plane is provided per each color of an image to be printed (halftone processing performed for each color component in a color printer (column 8, lines 18-46)).

Regarding claims 9 and 10, Ushiroda discloses a method of applying a correction to image data to correct for a printer response characteristic, said method comprising the steps of: generating a correction characteristic to correct for said printer response characteristic, wherein said printer response characteristic is based on a response characteristic of a printer device (correction look-up table for generating daughter mask from mother mask (Fig. 3) created in accordance with output characteristics of the printer corresponding to a specific paper type (column 5, line 52 – column 6, line 21) or various conditions such as the use of environment, total print count, and the like (column 10, line 28 – column 11, line 17)); applying said correction characteristic to a relatively high bit content halftone matrix data, to obtain a relatively low bit content halftone matrix data corrected for said printer response characteristic (daughter mask generated from mother mask in accordance with correction look-up table (column 4, lines 28-35); and processing said image data using said relatively low bit content halftone matrix data (halftone processing unit compares pixel values of multi-valued image data and threshold values of daughter mask (column 3, lines 44-47)). Said step

of generating a correction characteristic is carried out automatically by said printer device (density of sample toner image for generating correction characteristic detected automatically (column 10, lines 28-36)).

Regarding claim 11, said correction characteristic is generated dynamically, and applied to said relatively high bit content halftone matrix in vector format (column 10, line 37 – column 11, line 10).

Claims 12-21 recite a computer readable storage medium on which is embedded one or more computer programs for implementing the method steps recited in above-rejected claims 1 and 3-11, respectively. Such a medium is disclosed in Ushiroda (column 11, lines 23-37).

Claim 27 recites an image printer comprising means for performing the steps of above-rejected claim 1. Such a printer is disclosed in Ushiroda (column 11, lines 18-22).

Regarding claims 22-26, Ushiroda discloses an image printer system configured to generate a linearized halftone matrix for a printer, said printer system comprising: a linearization function (correction values stored in dot number correction LUTs (column 3, lines 19-36)); a high bit half-tone matrix (mother mask (column 4, lines 9-22)); and a processor configured to compile a linearized halftone matrix based on said linearization function said high bit halftone matrix (daughter mask compiled based on a selected LUT and mother mask (column 3, line 56 – column 4, line 8)). The system further comprises: a target response (non-correction LUT (column 5, lines 60-67)); and an actual response, wherein said processor is further configured to calculate said linearization function

based on said target response and said actual response (densities of step chart corresponding to non-correction LUT measured, output characteristics obtained (column 6, lines 1-21)). Said printer is configured to print a calibration patch (step chart (Fig. 9)); and said processor is further configured to determine said actual response based on said calibration patch (column 6, lines 1-21). Said printer is further configured to print an image based on said linearized halftone matrix and data associated with an image (printer outputs halftone image (column 3, lines 50-52) according to output characteristics (column 6, lines 1-21)).

Conclusion

6. Applicant's preliminary amendment was inadvertently overlooked in formulating the rejections set forth in the prior Office action. Accordingly, this Office action is non-final.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas D. Lee whose telephone number is (571) 272-7436. The examiner can normally be reached on Monday-Friday (7:30-5:00), alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on (571) 272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas D. Lee
Primary Examiner
Art Unit 2624

tdl
September 7, 2005